

Tektronix®

8500
MODULAR MDL SERIES
PROM
PROGRAMMER
CONTROLLER
INSTALLATION
SERVICE

INSTRUCTION MANUAL



WARNING

THE FOLLOWING SERVICING INSTRUCTIONS
ARE FOR USE BY QUALIFIED PERSONNEL ONLY.
TO AVOID PERSONAL INJURY, DO NOT
PERFORM ANY SERVICING OTHER THAN THAT
CONTAINED IN OPERATING INSTRUCTIONS
UNLESS YOU ARE QUALIFIED TO DO SO.

**PLEASE CHECK FOR CHANGE INFORMATION
AT THE REAR OF THIS MANUAL**

This manual supports the following
TEKTRONIX products:

8550 Option	8540 Option	Products
30	30	8550F30 8550F30 Option 01

8500

**MODULAR MDL SERIES
PROM
PROGRAMMER
CONTROLLER
INSTALLATION
SERVICE**

**Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077**

070-3903-00
Product Group 61

First Printing OCT 1981
Revised JUN 1982

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PREFACE

ABOUT THIS MANUAL

This manual tells how to install the 8500 MDL Series PROM Programmer Controller in an 8301 Microcomputer Development Unit or an 8540 Integration Unit.

CAUTION

The PROM Programmer Controller should only be installed by a Tektronix Field Service Specialist. Tektronix, Inc., is not obligated to furnish service to repair damage resulting from attempts by unauthorized personnel to install this product. Please call your nearest Tektronix Field Service Office for installation.

EQUIPMENT NOMENCLATURE

In this manual, the term "PROM Programmer" refers to a complete PROM Programmer system, consisting of the PROM Programmer Controller and one of several optional PROM Programmer Modules. A PROM Programmer Module enables the PROM Programmer to support specific programmable devices. PROM Programmer Modules are also referred to as "Characteristic Modules".

NOTE

Throughout this manual, all references to the "development system" or "the mainframe" refer equally to the 8301 Microprocessor Development Unit and to the 8540 Integration Unit, unless otherwise stated.

Preface - PROM Programmer Installation

MANUAL ORGANIZATION

The 8500 MDL Series PROM Programmer Controller Installation Manual is divided into four sections:

- Section 1 contains general information about the PROM Programmer, including specifications.
- Section 2 provides detailed installation procedures for the PROM Programmer Controller.
- Section 3 discusses verification and calibration of the installed PROM Programmer Controller.
- Section 4 contains information about jumper settings.

DOCUMENTATION OVERVIEW

Support documentation for TEKTRONIX microcomputer development systems consists of three groups of manuals: service manuals, installation manuals, and user's manuals.

SERVICE MANUALS

Service manuals provide the information necessary to perform system testing, to isolate hardware problems, and to repair system components. Service manuals are identified by their blue covers and may be purchased from Tektronix as optional accessories.

The following manuals provide service information for the PROM Programmer and its host systems:

- 8500 MDL Series PROM Programmer Controller Service Manual
- 8301 Microprocessor Development Unit Service Manual
- 8540 Integration Unit Service Manual

Also available are service manuals for Emulator Processor modules, peripheral equipment, and other optional features, such as the Trigger Trace Analyzer.

INSTALLATION MANUALS

Installation manuals or guides tell how to unpack the equipment, and how to install it and verify its proper operation. Installation manuals may be separate manuals with blue covers, or may be provided as supplements to existing publications. Installation manuals are provided with system components as standard accessories.

The following manuals provide installation information for the PROM Programmer's host systems.

- 8550 Microcomputer Development Lab Installation Guide
- 8540 Integration Unit Installation Guide

USER'S MANUALS

User's manuals describe procedures required to operate the development system and its peripheral devices. User's manuals are identified by their grey covers and are provided as standard accessories in the system package.

For an overview of your development system and its capabilities, the following manuals may be of interest.

- 8550 Microcomputer Development Lab System User's Manual
- 8540 Integration Unit System User's Manual

To derive the greatest benefit from this manual, you should be familiar with your TEKTRONIX microcomputer development system, as described in the appropriate manuals listed here.

GENERAL INFORMATION

REVISION HISTORY

As this manual is revised and reprinted, revision history information is included on the text and diagram pages. Original manual pages are identified with an '@' symbol at the bottom inside corner of the page. When existing pages are revised, the '@' symbol is replaced with a revision code and date (REV A OCT 1981). New pages added to a section, whether they contain old, new, or revised information, will be identified with the '@' symbol and a date (@ OCT 1981).

Preface - PROM Programmer Installation

CHANGE INFORMATION

Change notices are issued by Tektronix, Inc., to document changes to the manual after it has been published. Change information is located at the back of this manual, following the yellow tab marked "CHANGE INFORMATION & TEST EQUIPMENT". When you receive the manual, you should enter any change information into the body of the manual, according to the instructions on the change notice.

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OPERATORS SAFETY SUMMARY

The general safety information in this part of the summary is for both operating and servicing personnel. Specific warnings and cautions will be found throughout the manual where they apply, but may not appear in this summary.

TERMS

In This Manual

CAUTION statements identify conditions or practices that could result in damage to the equipment or other property.

WARNING statements identify conditions or practices that could result in personal injury or loss of life.

As Marked on Equipment

CAUTION indicates a personal injury hazard not immediately accessible as one reads the marking, or a hazard to property including the equipment itself.

DANGER indicates a personal injury hazard immediately accessible as one reads the marking.

SYMBOLS

As Marked on Equipment



DANGER high voltage.



Protective ground (earth) terminal.



ATTENTION - Refer to manual.

Safety Summary – PROM Programmer Installation

SAFETY PRECAUTIONS

Grounding the Product

This product is grounded through grounding conductors in the interconnecting cables. To avoid electrical shock, plug the supporting system's power cord into a properly wired receptacle. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Use the Proper Fuse

To avoid fire hazard, use only the fuse specified in the parts list for your product. Be sure the fuse is identical in type, voltage rating, and current rating.

Refer fuse replacement to qualified service personnel.

Do Not Operate in Explosive Atmospheres

To avoid explosion, do not operate this product in an atmosphere of explosive gases unless it has been specifically certified for such operation.

Do Not Remove Covers or Panels

To avoid personal injury, do not remove the product covers or panels. Do not operate the product without the covers and panels properly installed.

Safety Summary - PROM Programmer Installation

SERVICING SAFETY SUMMARY FOR QUALIFIED SERVICE PERSONNEL ONLY

(Refer also to the preceding Operators Safety Summary)

Do Not Service Alone

Do not perform internal service or adjustment of this product unless another person capable of rendering first aid and resuscitation is present.

Use Care When Servicing With Power On

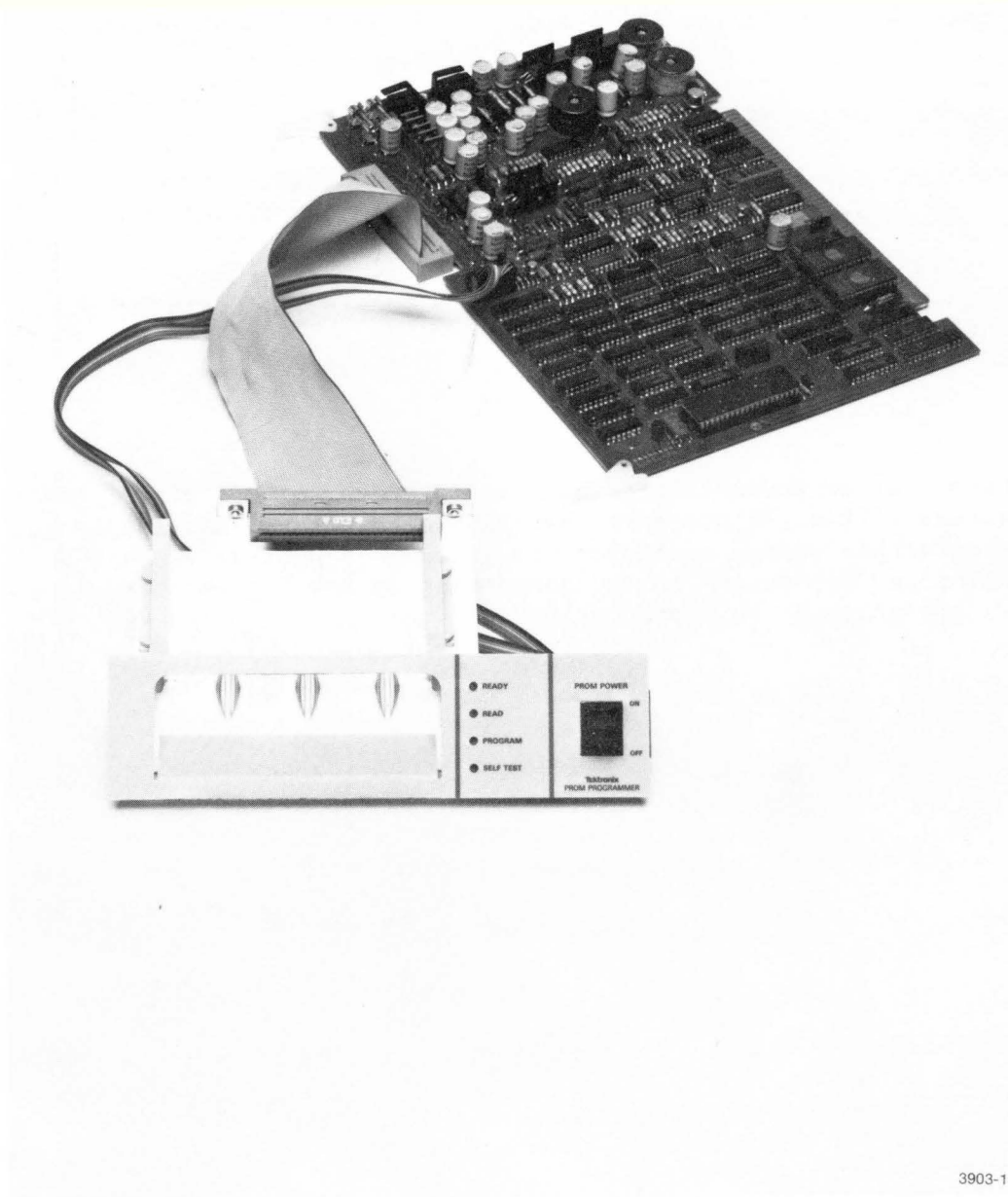
Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on.

Disconnect power before removing protective panels, soldering, or replacing components.

Power Source

The system that supports this product is intended to operate from a power source that will not apply more than 250 volts between the supply conductors or between either supply conductor and ground. A protective ground by way of the grounding conductor in the supporting system's power cord is essential for safe operation of this product.

PROM Programmer Installation



3903-1

8500 MDL Series PROM Programmer Controller

Section 1

GENERAL INFORMATION

INTRODUCTION

The 8500 MDL Series PROM Programmer is used in the development of microcomputer-based products as a way of transferring software to ROM. Specifically, the PROM Programmer allows the user to:

- verify that a PROM has been erased.
- program a PROM.
- verify that a program has been transferred correctly.

The PROM Programmer also provides extensive diagnostic capabilities to ease repair.

PRODUCT DESCRIPTION

The PROM Programmer consists of two assemblies: the PROM Programmer Controller, and one of several optional PROM Characteristic Modules that enable the PROM Programmer to support specific devices. Figure 1-1 shows a PROM Programmer Controller and a Characteristic Module installed in an 8301 Microprocessor Development Unit (MDU).

PROM PROGRAMMER CONTROLLER

The PROM Programmer Controller is basically a small 8085A-based microcomputer system that provides:

- operating and diagnostic command execution for the PROM Programmer.
- interface with the development system.
- a five-channel programmable power supply.
- universal PROM Characteristic Module interface.

The PROM Programmer Controller consists of a Controller board and a front panel assembly. The Controller Board plugs directly into the mainframe's Main Interconnect board, and is connected to the front panel assembly by two cables.

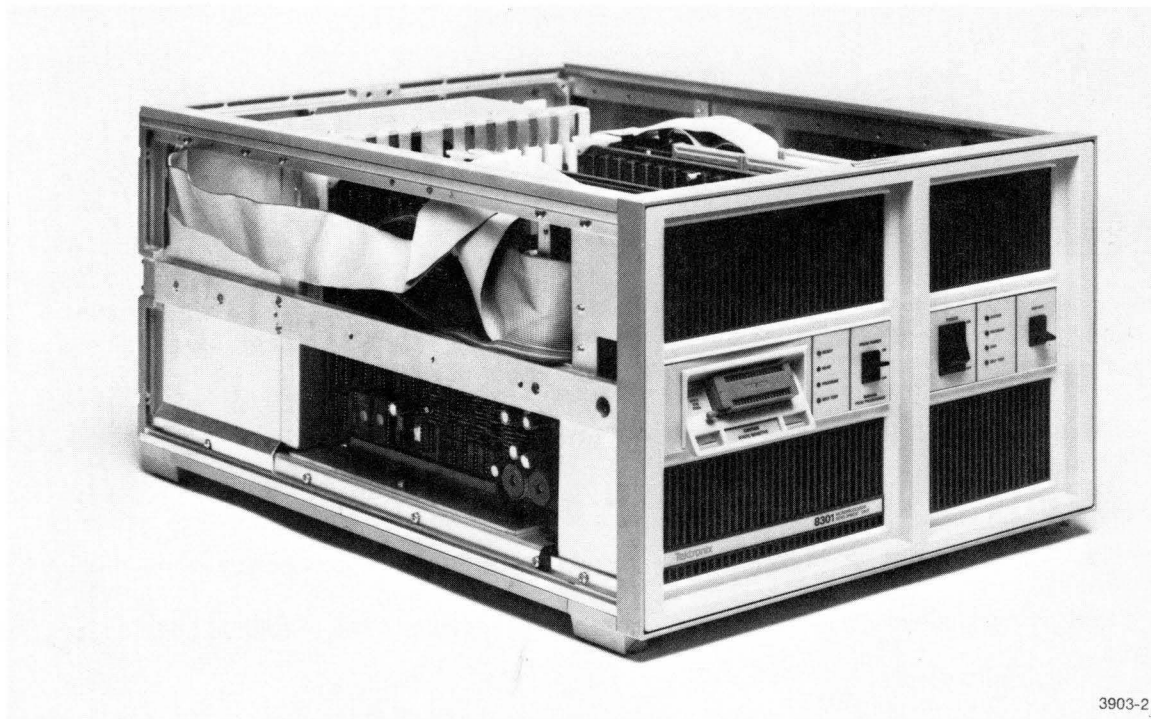


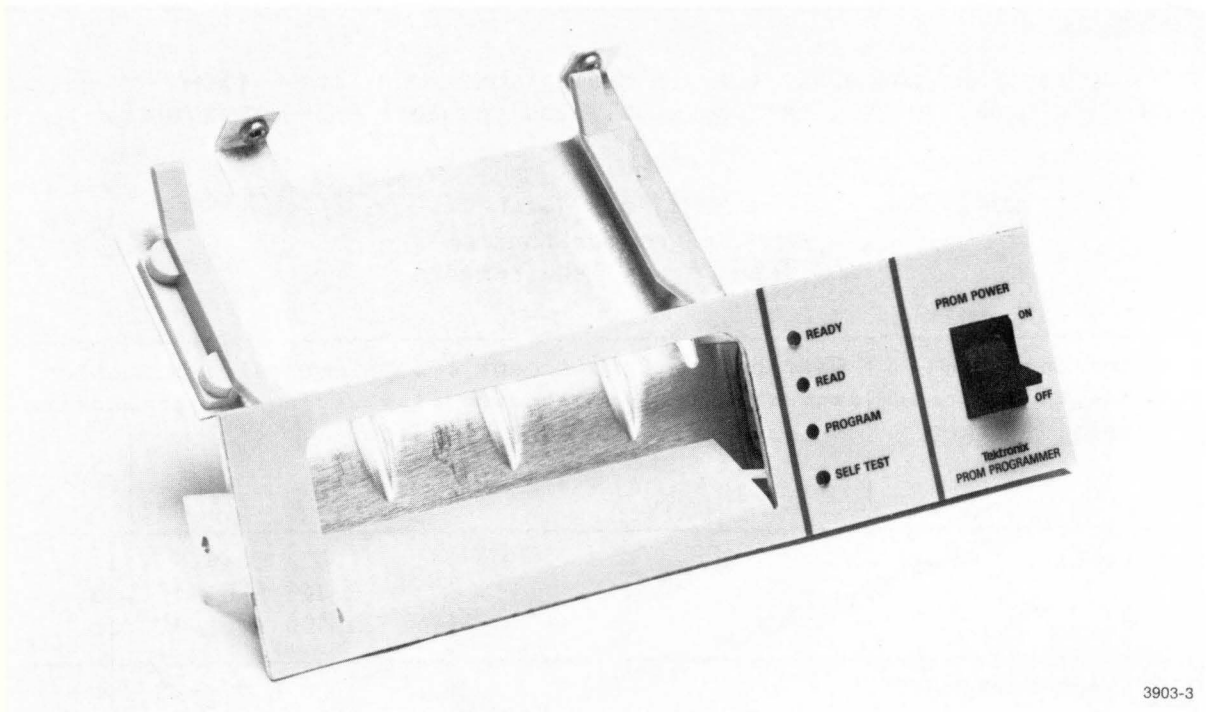
Fig. 1-1. A PROM Programmer Controller installed in an 8301 MDU, with a Characteristic Module in place.

The front panel assembly (Fig. 1-2) replaces the blank trim panel on the left side of the mainframe's front panel. The assembly consists of an edge connector chassis for Characteristic Modules, and a circuit board that contains the PROM POWER switch and status indication LEDs.

CHARACTERISTIC MODULES

Different Characteristic Modules may be connected to the PROM Programmer Controller through the front panel assembly. Each Characteristic Module supports a unique device or family of devices. A zero-insertion force (ZIF) socket on each module protrudes from the front panel, and the device to be programmed is inserted into this socket.

General Information - PROM Programmer Installation



3903-3

Fig. 1-2. PROM Programmer front panel assembly.

General Information - PROM Programmer Installation

SPECIFICATIONS

This subsection contains the specifications for the PROM Programmer Controller's electrical, environmental, and physical characteristics.

Table 1-1
PROM Programmer Controller
Input Power Requirements

Characteristic	Performance Requirement	Supplemental Information
Supply Voltages	+5.2 Vdc +1%/-2% +12 Vdc $\pm 5\%$ -12 Vdc $\pm 5\%$	
Current (standby)		1.0 A @ +5.2 Vdc 0.125 A @ +12 Vdc 0.100 A @ -12 Vdc
Current (maximum)		3.00 A @ +5.2 Vdc 1.40 A @ +12 Vdc 1.15 A @ -12 Vdc
Power Dissipation (maximum)		46.2 W

General Information - PROM Programmer Installation

Table 1-2
Performance Requirements for
Programmable Power Supply Channels 1--4

Characteristic	Performance Requirement				
	Channel 1	Channel 2	Channel 3	Channel 4 low range	Channel 4 high range
DC Voltage					
minimum	4.0 V	4.0 V	4.0 V	-5.0 V	-23.0 V
maximum	30.0 V	30.0 V	12.0 V	-25.0 V	-40.0 V
Regulation					
typical	12 mV	12 mV	10 mV	0.8% Vout	0.3% Vout
worst case	0.5% Vout ±10 mV	0.5% Vout ±10 mV	0.65% Vout ±15 mV	1.5% Vout ±5 mV	1.5% Vout ±5 mV
Ripple					
maximum P-P	1%	1%	0.5%	0.5%	0.5%
Resolution					
Control (a)	117 mV +2 mV/-4 mV	117 mV +2 mV/-4 mV	38 mV ±1.5 mV	78 mV ±12 mV	78 mV ±12 mV
Sense (b)	125 mV	125 mV	62.5 mV	125 mV	200 mV
Initial Accuracy (c)	±200 mV	±200 mV	±100 mV	±200 mV ±4% @ -5.0 V	±320 mV

- (a) The control resolution is 1/255 of the specified channel's voltage range.
- (b) The sense resolution is 1/255 of the specified channel's output range from 0 V to the channel's maximum voltage.
- (c) Initial accuracy is dependent on both control and sense resolution. The initial accuracy specification is made only with respect to output voltages that are exact multiples of the sense resolution. An additional error component (not exceeding 50% of the sense resolution) must be considered when output voltages are not an exact multiple of the sense resolution.

General Information - PROM Programmer Installation

Table 1-3
Supplemental Information for
Programmable Power Supply Channels 1--4

Characteristic	Description				
	Channel 1	Channel 2	Channel 3	Channel 4 low range	Channel 4 high range
DC Current maximum	270 mA	300 mA @ 4-18 V 200 mA @ 18-30 V	800 mA @ 4-11 V 700 mA @ 11-12 V	130 mA	150 mA

Table 1-4
Power Channel 5 Characteristics

Characteristic	Performance Requirement		Supplemental Information	
	Channel 5VF	Channel 5VS	Channel 5VF	Channel 5 VS
DC Voltage minimum	5.09 V	4.8 V		
maximum	5.25 V	5.25 V		
DC Current maximum			600 mA	400 mA

Table 1-5
Environmental Characteristics

Characteristic	Description
Temperature Operating Storage	0° C to +50° C (+32° F to +122° F) -55° C to +75° C (-67° F to +167° F)
Humidity	90% relative, maximum non-condensing
Altitude Operating Storage	4 500 m (15,000 ft) maximum 15 000 m (50,000 ft) maximum

General Information - PROM Programmer Installation

Table 1-6
PROM Programmer Controller Board
Physical Characteristics

Characteristic	Description
Height	20 mm (0.8 in)
Width	192 mm (7.6 in)
Length	280 mm (11.0 in)

Table 1-7
Front Panel Assembly
Physical Characteristics

Characteristic	Description
Height	48 mm (1.9 in)
Width	204 mm (8.0 in)
Length	131 mm (5.2 in)

Section 2

INSTALLATION PROCEDURES

INTRODUCTION

Because installation of the PROM Programmer Controller is a fairly complex procedure, it is essential that you have a large, well-lit workspace, free from clutter.

The PROM Programmer Controller consists of the following items:

- One PROM Programmer Controller Board.
- One PROM Programmer front panel assembly.
- One 50-conductor flat cable, with a connector on each end.
- One dual 8-conductor ribbon cable, with a harmonica connector on each end.
- Three #4 Phillips-head screws.
- One 2764 operating system PROM (8540 only).

The PROM Programmer Controller installation procedure consists of three major steps:

- Preparing the development system.
- Installing the front panel assembly.
- Installing the PROM Programmer Controller Board.

CAUTION

When used with the PROM Programmer, some emulators or other installed options can cause excessive power supply loading. Refer to the Emulator Specifics Supplement of your system users manual for information about whether the PROM Programmer can be used with your emulator.

PREPARING THE DEVELOPMENT SYSTEM

NOTE

In this section, the directions "left" and "right" refer to your perspective as you face the mainframe.

WARNING

Be sure that the development system's power switch is OFF and that the line cord is disconnected.

1. Place the development system on the workbench so that the rear panel is facing you.
2. Remove the upper left, upper right, and lower right cover retainers. See Fig. 2-1.

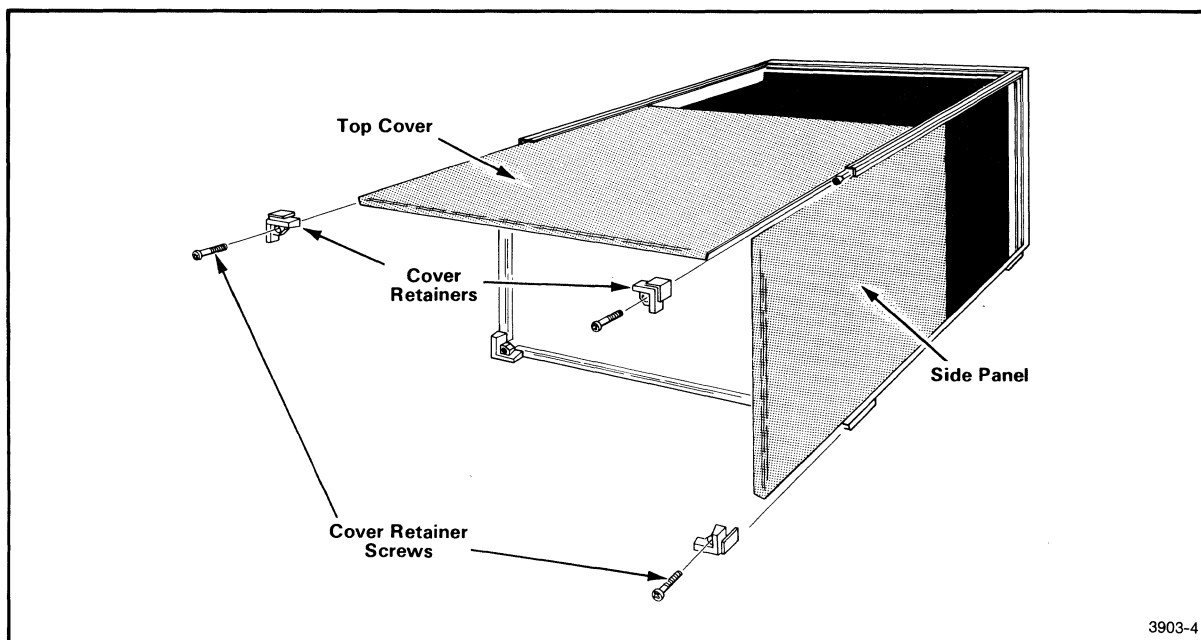


Fig. 2-1. Removing the cover retainers.

3. Remove the top cover by sliding it toward the back of the unit.
4. Remove the right side panel by sliding it toward the back of the unit.

Installation Procedures - PROM Programmer Installation

5. Turn the unit around 180 degrees, so the front panel now faces you.
6. Locate the 40-conductor cable connecting the System Controller board and the Communication Interface board. Disconnect the cable from the System Controller Board, and fold it toward the back of the unit.
7. Notice the square opening on the left side of the unit, near the front panel. See Fig. 2-2. Insert a finger through this opening and press on the front panel spring retaining clip. The front panel will pop loose.
8. Store the blank front panel in a safe place, in case you need to reinsert it.

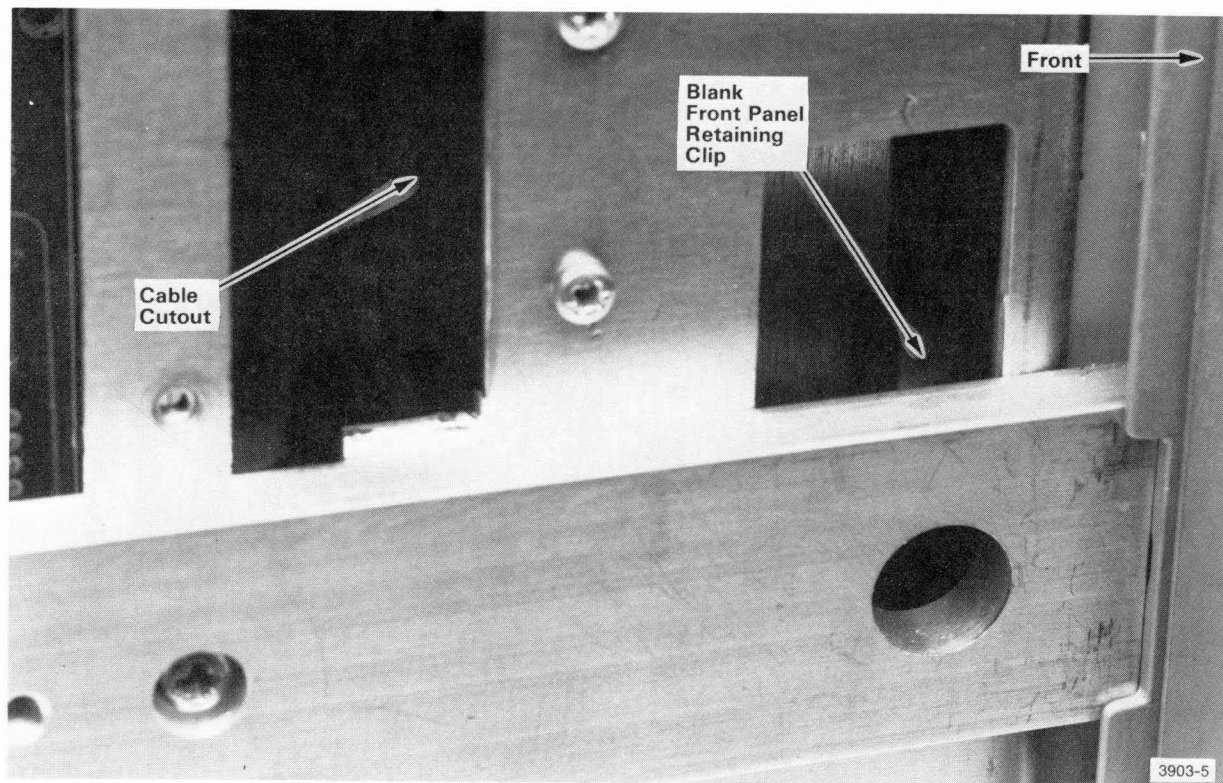
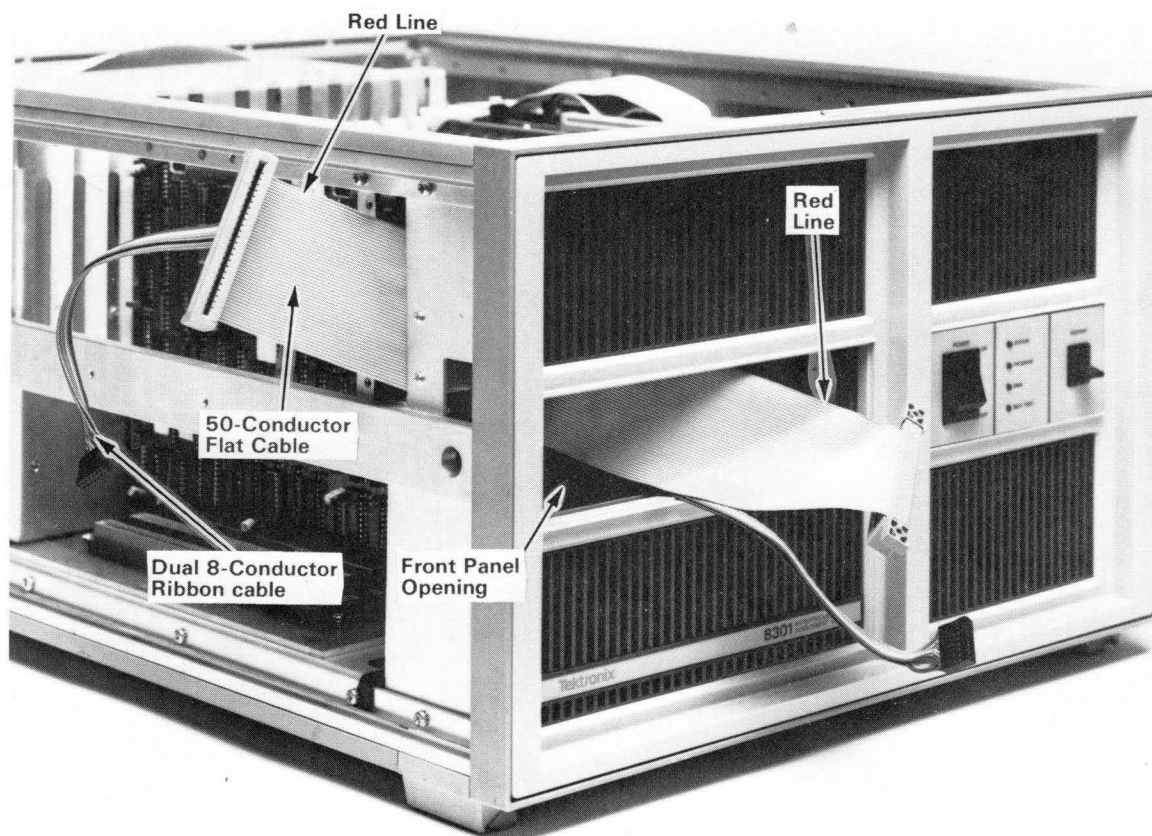


Fig. 2-2. Removing the blank front panel.

This completes the procedure for preparing your development system.

INSTALLING THE FRONT PANEL ASSEMBLY

1. Refer to Fig. 2-3. Insert one end of the 50-conductor flat cable through the front panel opening, and thread the cable through the cable cutout on the left side of the mainframe (the cable cutout is shown in Fig. 2-2). The red line on the cable must face up and to the right.
2. Insert the dual 8-conductor ribbon cable through the front panel opening and the cable cutout. Make sure that this cable lies between the 50-conductor cable and the black card cage panel. This step is also illustrated in Fig. 2-3.



3903-6

Fig. 2-3. Cable insertion.

Installation Procedures - PROM Programmer Installation

3. Grasp the end of the 50-conductor cable that is protruding from the front panel opening. Fold this end of the cable up and to the right 90 degrees, as shown in Fig. 2-4. Carefully make a crease on the fold line.
4. Connect the PROM Programmer front panel assembly to the front connector of the 50-conductor cable, as shown in Fig. 2-5. Use two #4 Phillips-head screws.

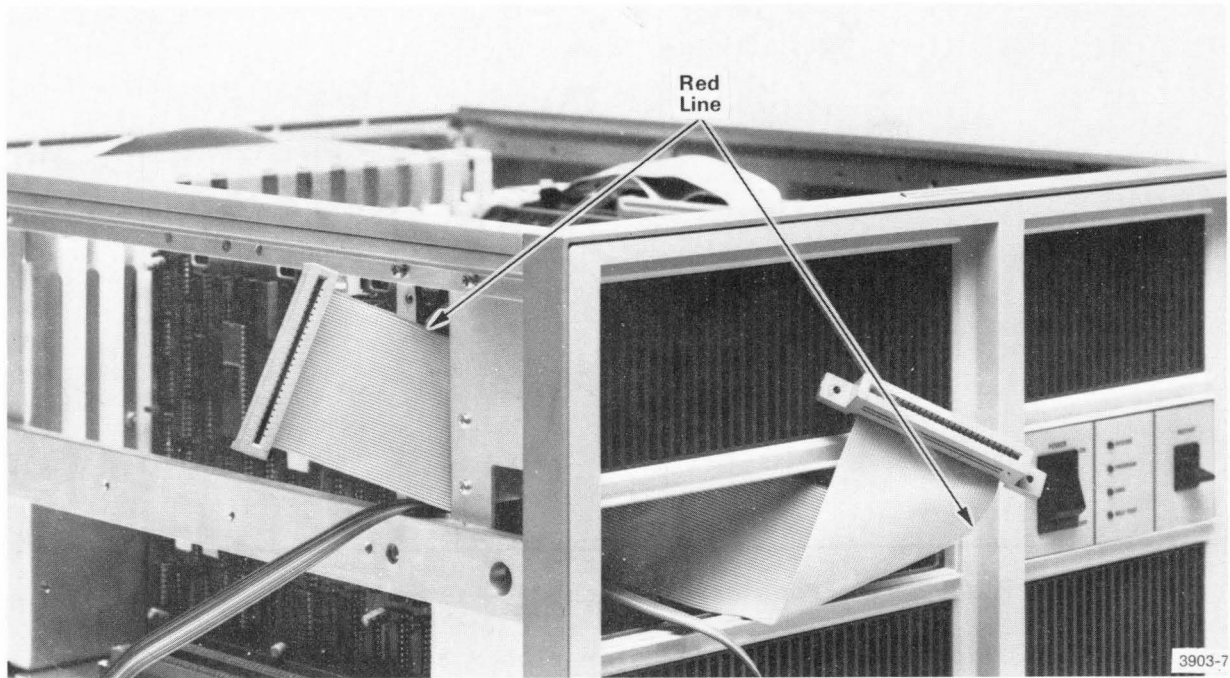


Fig. 2-4. Folding the flat cable.

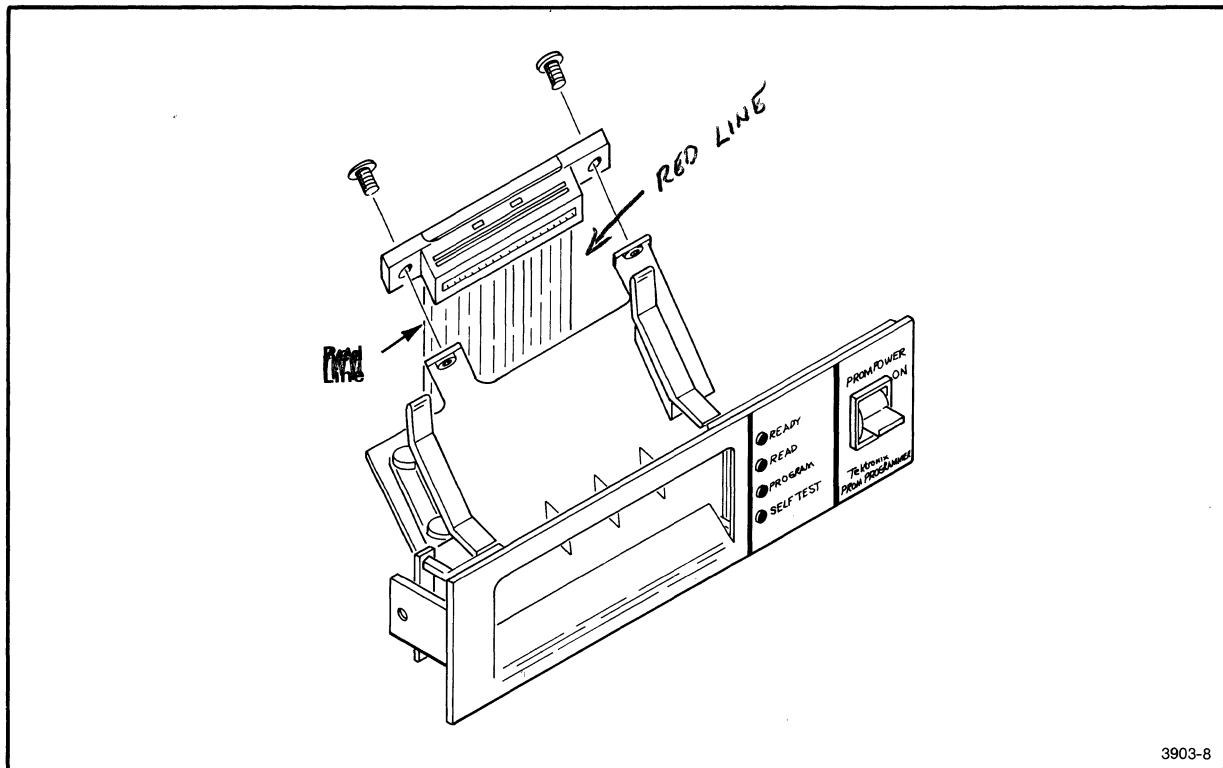


Fig. 2-5. Front panel assembly - flat cable connection.

5. Connect the dual 8-conductor ribbon cable to the connector on the reverse side of the front panel circuit board. Align the arrow on the harmonica connector with the arrow on the circuit board.
6. Insert the front panel assembly into the front panel opening, aiming the chassis of the front panel assembly up and back. Ensure that the spring retaining clip on the right side of the front panel remains tucked in until the assembly is fully inserted. At that time, the clip will engage with the mainframe's subpanel.
7. Now refer to Fig. 2-6. Attach the front panel assembly subpanel bracket to the mainframe's PROM Programmer bracket, using the remaining Phillips screw and a magnetic screwdriver. A hole in the center frame rail of the mainframe provides access to the brackets.

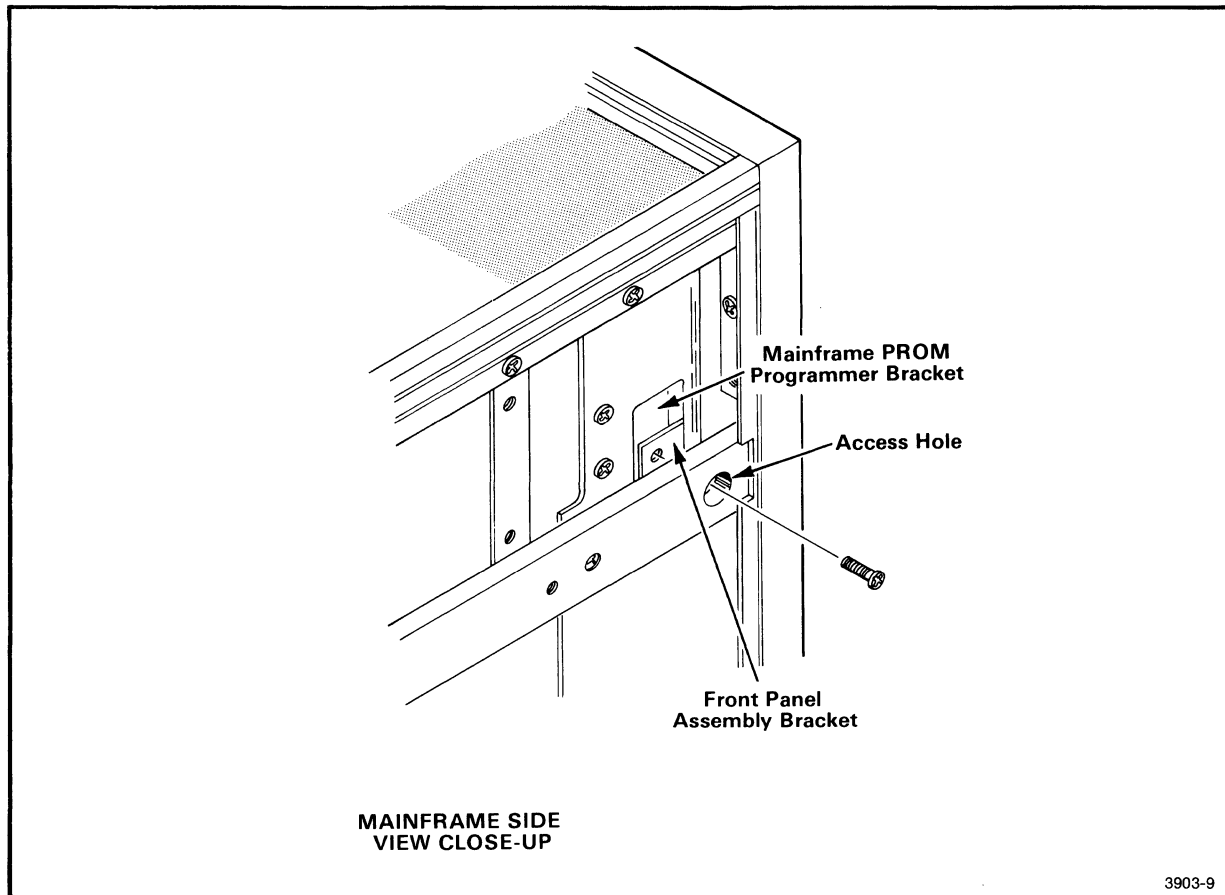


Fig. 2-6. Bracket attachment, as viewed from the left side of the mainframe.

This completes the PROM Programmer front panel assembly installation.

INSTALLING THE PROM PROGRAMMER CONTROLLER BOARD

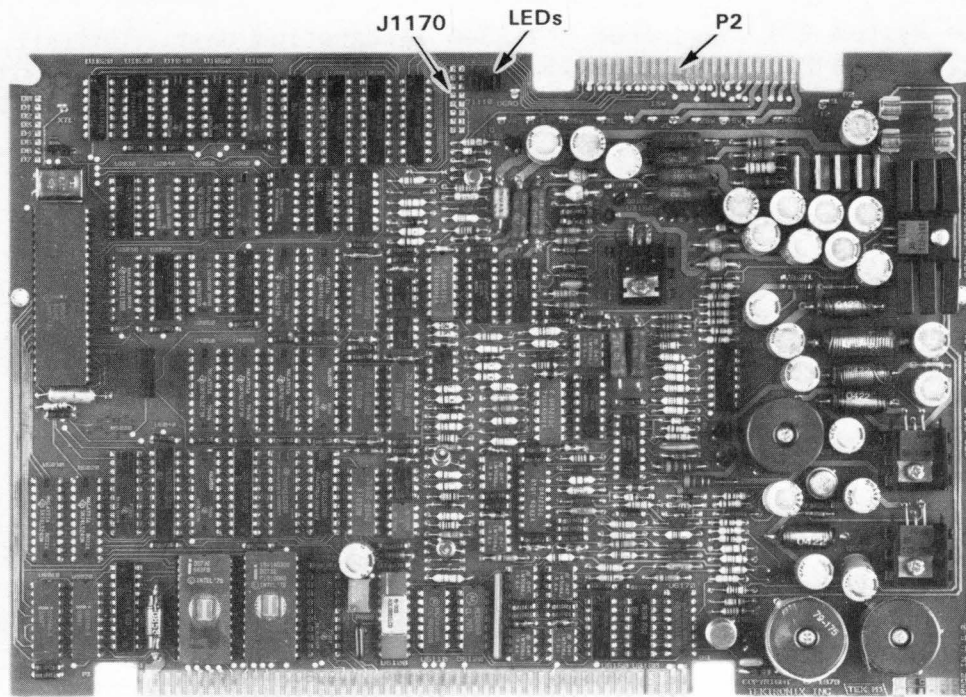
1. Insert the PROM Programmer Controller Board into either slot J1 or J2 of the Main Interconnect board. (These connectors are marked PROM PROGRAMMER CONTROLLER and SPARE, respectively.)

CAUTION

The PROM Programmer Controller Board must be installed only in J1 or J2. Otherwise, your development system may not operate properly.

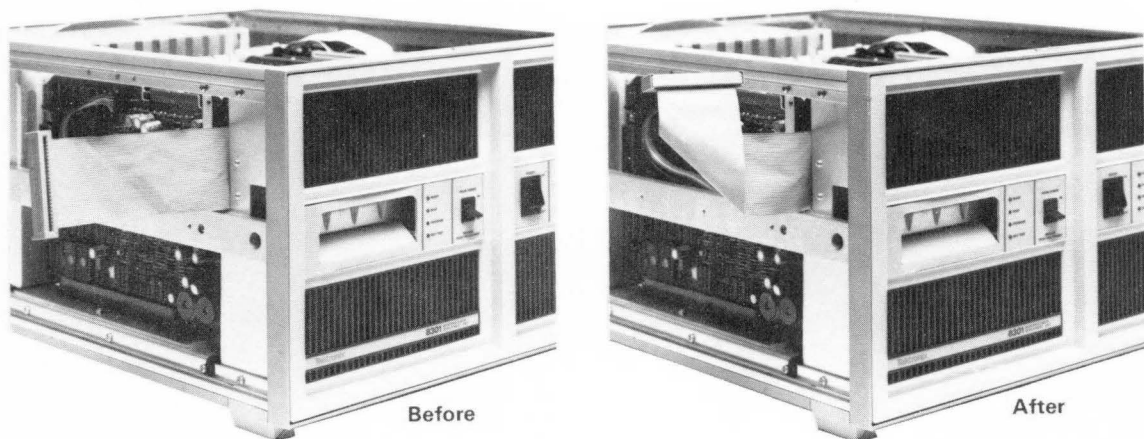
2. Connect the dual 8-conductor ribbon cable to J1110 on the Controller Board. See Fig. 2-7. Pin 1 of J1110 is indicated by a square pad at the pin's base. Align the arrow on the harmonica connector with pin 1. Fold back any extra cable alongside the circuit board.
3. Hold the 50-conductor flat cable straight out from the side of the mainframe. Make a 90-degree fold in the cable so that the connector faces up, as shown in Fig. 2-8. Carefully crease the cable along the fold.
4. Bend the 50-conductor flat cable back toward the PROM Programmer Controller Board and connect the cable to edge connector P2. Refer again to Fig. 2-7. Place any extra cable behind the front panel assembly.

Installation Procedures - PROM Programmer Installation



3903-10

Fig. 2-7. Controller board cable connectors.



3903-11

Fig. 2-8. Folding the flat cable, final step (as viewed from the front of the mainframe).

This completes the installation and connection of the PROM Programmer Controller Board.

Installation Procedures - PROM Programmer Installation

INSTALLING THE OPERATING SYSTEM PROM (8540 ONLY)

Remove the System ROM board from the 8540 Integration Unit. Install the 2764 operating system PROM in any available socket. Now reinstall the System ROM board in its correct slot. Refer to the 8540 Integration Unit Installation Guide for more information.

REASSEMBLING THE DEVELOPMENT SYSTEM

Reconnect the 40-conductor Communications Interface cable to the System Controller board. Replace the mainframe's top and side covers, along with the three cover retainers. The PROM Programmer is now ready for use.

GROUNDING

A proper ground system is mandatory for satisfactory operation of your microcomputer development system. The PROM Programmer Controller, as well as any optional or peripheral equipment, must be properly grounded to reduce susceptibility to static discharge. See your system installation guide for proper grounding procedures.

Section 3VERIFICATION AND CALIBRATIONVERIFICATION

You can perform the following tests to verify correct operation of your installed PROM Programmer Controller. First, turn on the development system and observe the indicators on the PROM Programmer front panel. They should light briefly (1 second, maximum), and then go out. Next, insert a Characteristic Module and turn the PROM POWER switch on. The READY indicator should light.

If the PROM Programmer Controller doesn't pass either of these tests, remove the top cover of your development system and observe the three status LEDs on top of the PROM Programmer Controller Board. Refer back to Fig. 2-7, in Section 2 of this manual. These LEDs identify the block of circuitry that has failed. Table 3-1 defines the status of the LED indicators as viewed from the system (left) side of your mainframe. A "1" indicates that the LED is lit.

Table 3-1
Status LED Definitions

LED States	Definition
111	Unable to start power-up tests.
110	CPU failure.
101	RAM failure.
100	ROM failure.
011	Power Monitor failure.
010	Power control failure.
001	Characteristic Module +5V supply failure.
000	Power-up tests completed.

You can try entering the PSTAT command to get more information about the failure. The PSTAT command usually executes even when there is a hardware failure in the PROM Programmer circuitry.

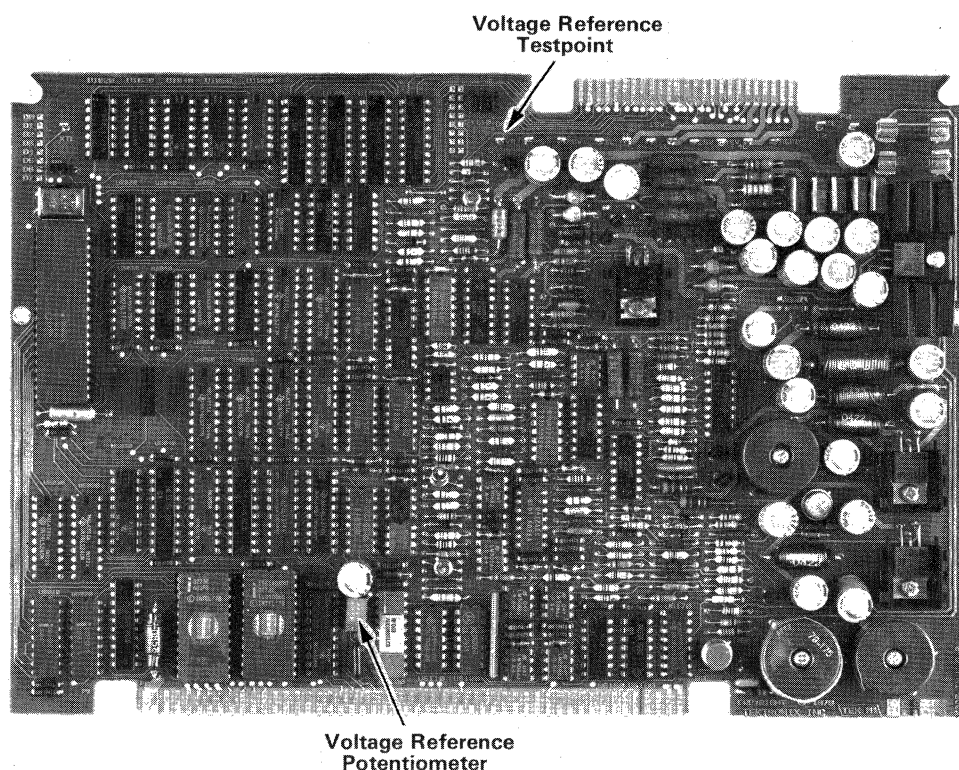
If a Power Monitor failure is indicated by either the Controller Board LEDs or the PSTAT command, refer to the following calibration procedure. If calibration doesn't correct the problem, or if one of the other failures occurred, refer to the optional PROM Programmer Controller Service Manual.

Verification and Calibration - PROM Programmer Installation

CALIBRATION

The PROM Programmer Controller has been calibrated at the factory. If recalibration is necessary, use the following procedure:

Connect a voltmeter with 1 mV resolution between the voltage reference testpoint (labeled "VR" on the Controller Board) and ground. Adjust potentiometer R6091 until the voltage reference output is +5.05 Vdc, ± 5 mv. The locations of the voltage reference testpoint and potentiometer are shown in Fig. 3-1.



3903-12

Fig. 3-1. Voltage reference testpoint and potentiometer locations.

Section 4

JUMPERS

JUMPER CONFIGURATION

The PROM Programmer Controller has only one jumper, located on the Controller Board: the Forced-Instruction Jumper (J1012). Figure 4-1 shows the location and settings of the Forced-Instruction Jumper. In the normal position (position A), this jumper enables the 8085A's RD(L) control line. In the forced-instruction position (position B), this jumper causes the 8085A to execute a continuous sequence of NOP instructions. The forced-instruction position is used to test the processor address lines.

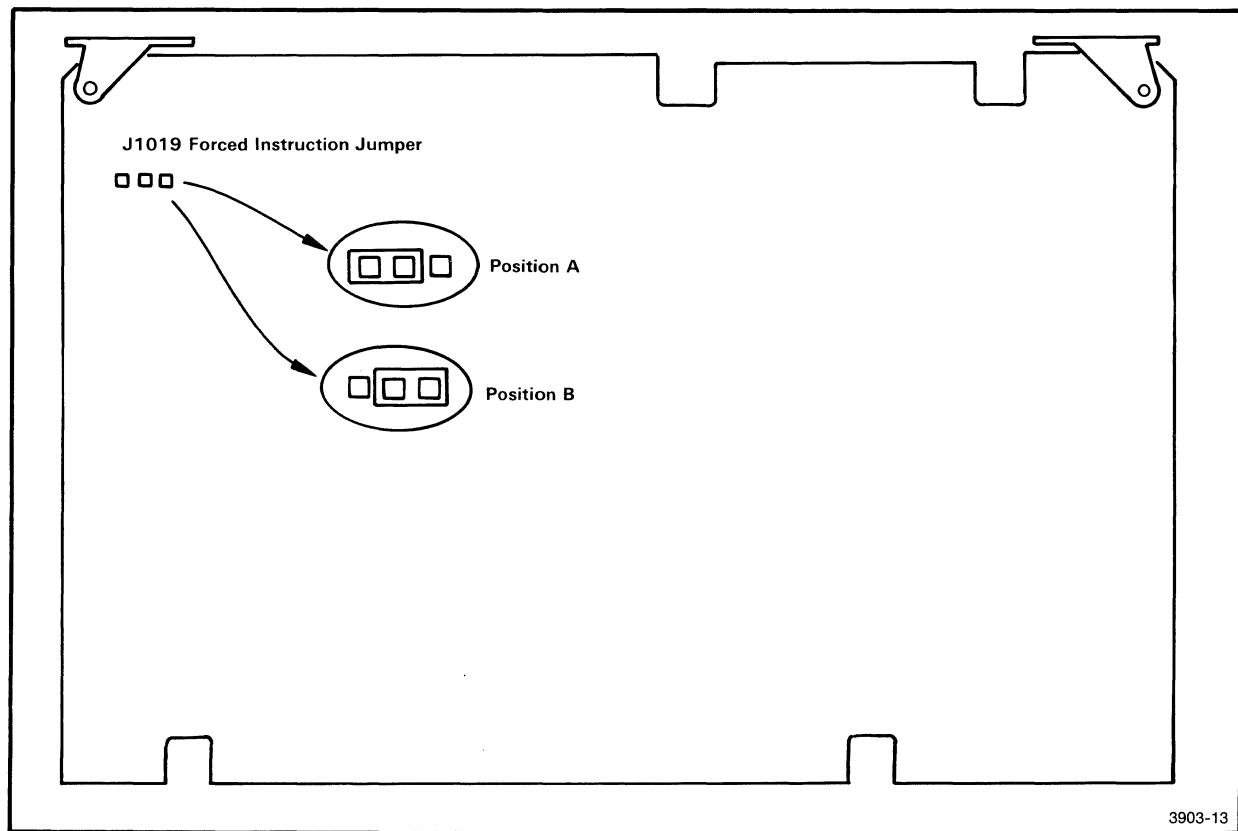


Fig. 4-1. Forced-Instruction Jumper.

MANUAL CHANGE INFORMATION

At Tektronix, we continually strive to keep up with latest electronic developments by adding circuit and component improvements to our instruments as soon as they are developed and tested.

Sometimes, due to printing and shipping requirements, we can't get these changes immediately into printed manuals. Hence, your manual may contain new change information on following pages.

A single change may affect several sections. Since the change information sheets are carried in the manual until all changes are permanently entered, some duplication may occur. If no such change pages appear following this page, your manual is correct as printed.

DESCRIPTION

TEXT CORRECTIONS

Page 3-1

Replace Table 3-1 with the following table:

Table 3-1
Status LED Definitions

LED States	Definition
111	Unable to start power-up tests.
110	CPU failure. (a)
101	ROM failure.
100	RAM failure.
011	Power Monitor failure.
010	Power control failure.
001	Characteristic Module +5V supply failure.
000	Power-up tests completed.

(a) A ROM or RAM failure may also cause this LED state.

Date: 10/28/81

Change Reference: C2/1181

Product: 8500 PROM Programmer Installation

Manual Part No.: 070-3903-00

DESCRIPTION

TEXT CORRECTIONS

Page 3-2, the text and illustration following the heading "CALIBRATION"

REPLACE WITH:

The PROM Programmer Controller has been calibrated at the factory. If recalibration is necessary, refer to the calibration procedure described in Section 2 of the optional PROM Programmer Controller Service Manual.

Date: 11-3-81Change Reference: C3/1181Product: 8500 PROM Programmer InstallationManual Part No.: 070-3903-00**DESCRIPTION****TEXT CHANGES**

Page 2-6

In Fig. 2-5, the red line should be on the right edge of the 50-conductor flat cable, and not on the left edge, as shown.

DESCRIPTION**TEXT CHANGES**

Page 2-8 Replace the text of Step 2 with the following procedure:

2. Connect the dual 8-conductor ribbon cable to J1110 on the Controller Board. See Fig. 2-7. Align the arrow on the harmonica connector with the pin of J1110 that is closest to the Controller Board's edge. Fold back any extra cable alongside the circuit board.

Page 2-9 Figure 2-7, the reference to J1170

CHANGE TO:

J1110

DESCRIPTION

Product Group 61

TEXT CHANGES

Page v In the list of Section 2 - Installation Procedures subheadings, replace the subheading "Installing the Operating System PROM (8540 Only)" with the following subheading:

Installing 8540 Option ROM 2-10

Page 2-10 Replace the heading "INSTALLING THE OPERATING SYSTEM PROM (8540 ONLY)" and associated paragraph with the following information:

INSTALLING 8540 OPTION ROM

When you are installing a new 8540 option or installing an 8550 to 8540 Option Conversion Kit, it is necessary to install Option ROM on the System ROM Board. There is no requirement for the ROM to be installed in specific sockets. However, it is recommended that the option ROM be installed in the following locations:

- The Emulator Option ROM should be installed in the sockets labeled CS82 through CS8B as shown in Fig. 2-9 (circuit numbers U1010 through U1070 and U3010 through U3070 on the System ROM Board).
- Install the PROM Programmer Option ROM in locations CS90 and CS91 as shown in Fig. 2-9 (circuit numbers U1110 and U1120 on the System ROM Board).
- The Communications Option (COMM Option) ROM should be installed in location CS8F as shown in Fig. 2-9 (circuit number U4060 on the System ROM Board).

DESCRIPTION

- Install the Trigger Trace Analyzer Option ROM in locations CS8E, CS8D and CS8C as shown in Fig. 2-9 (circuit numbers U4050, U4030 and U4010 on the System ROM Board).

The spare ROM sockets for options are limited. When you add or replace Emulator Processor Boards, it may be necessary to remove unneeded ROM to allow installation of required ROM.

Figure 2-9 shows the locations and the assigned labels for the 32 ROM sockets on the System ROM Board.

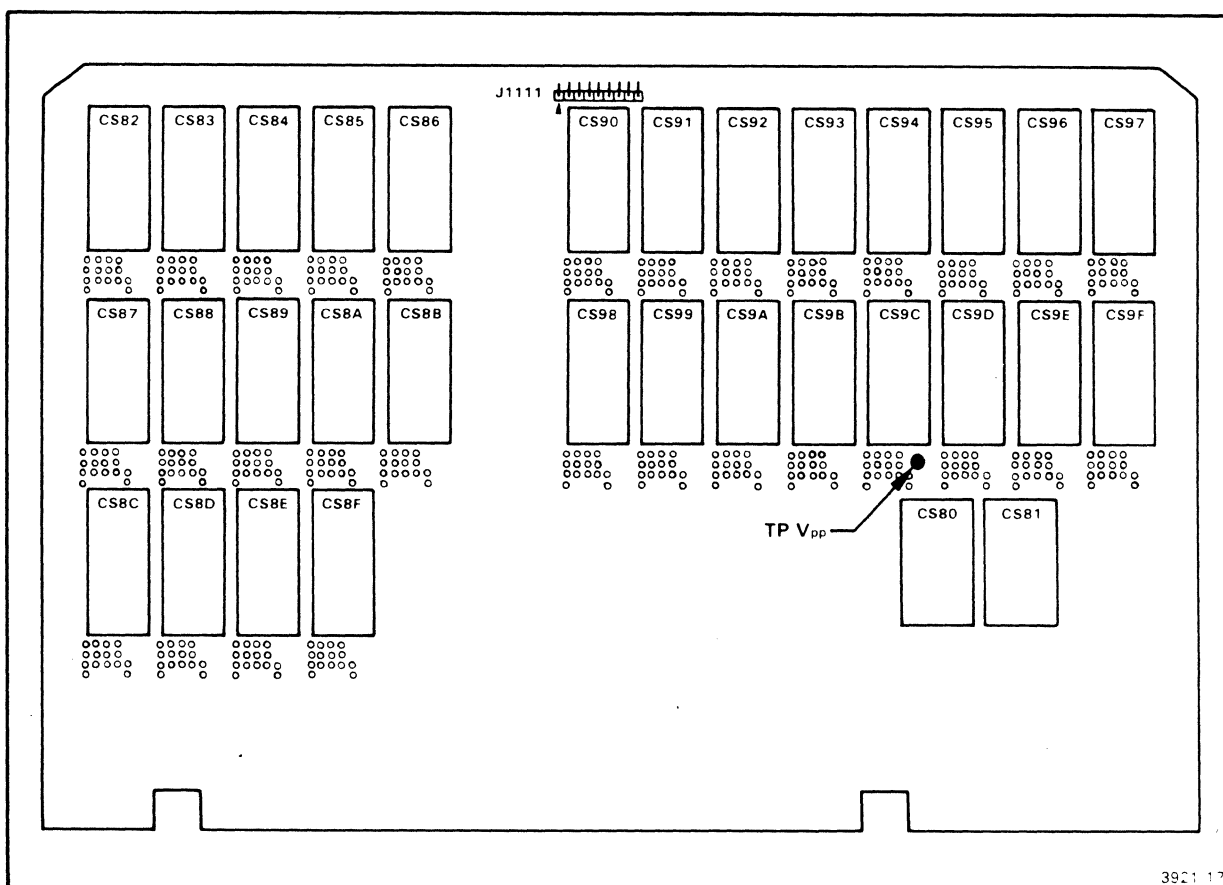


Fig. 2-9. System ROM Board socket locations.